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Maritimes Region

Canadian Science Advisory Secretariat
Science Response 2016/014

STATUS OF CUSK (*BROSME BROSME*) IN NAFO DIVISIONS 4VWX5Z UNDER THE PRECAUTIONARY APPROACH FRAMEWORK

Context

Cusk, *Brosme brosme*, is caught as bycatch in certain directed fisheries. Most landings are in the groundfish longline fisheries. Commercial catch rates for Cusk have declined since the 1980s. Changes to management measures (e.g., reductions to trip limits, overall caps, and bycatch percentages) may have contributed to this reduction in catch rates (and landings); however, it is thought the decline in catch per unit effort (CPUE) is also due to a decline in Cusk abundance (Harris and Hanke 2010). The extent of the decline in abundance is not known.

In 2003, Cusk was assessed asThreatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). In response to the 2003 assessment, the Governor in Council decided in 2013 not to add Cusk to the List of Wildlife Species at Risk set out in Schedule 1 of the Species at Risk Act (SARA). In November 2012, however, Cusk was reassessed as Endangered by COSEWIC and is subsequently under re-consideration for listing pursuant to SARA.

The Industry-DFO Halibut Fixed Station Longline Survey (Halibut Survey) catch per station has been accepted as a biomass index for Cusk (with the catch at each of 57 stations used in the index standardized to kilograms/1000 hooks). Reference points have been identified based on the DFO (2009) policy document "A fishery Decision-making Framework Incorporating the Precautionary Approach" (PA Framework). The Upper Stock Reference (USR) and Limit Reference Point (LRP) for Cusk were set at 26.6 kg and 13.3 kg, respectively, in the Halibut Survey (Harris et al. 2012). The 3-year geometric mean of the biomass index was accepted as the metric for monitoring Cusk status relative to the USR and LRP.

DFO's Resource Management Sector asked Science to determine the three-year geometric mean of the Cusk index from the Halibut Survey relative to the USR and the LRP. The information will be used by DFO Resource Management as guidance in discussions with various industry stakeholders on recommendations for management measures.

The current 3-year geometric mean (2013-2015) of the Cusk biomass index remains above the LRP at 19.0 kg., but is within the cautious zone.

The following Science Response Report results from the Science Response Process of December 7, 2015, on the 2015 Stock Status Update for 4VWX5 Cusk.

Background

The Halibut Survey, a longline survey that samples an area from the Grand Banks of Newfoundland and along the Scotian Shelf to Georges Bank, is considered to provide a useful index of trends in Cusk abundance in Northwest Atlantic Fisheries Organization (NAFO) Divisions 4VWX5 since 1999. Longline gear is an effective sampling tool for Cusk as

demonstrated by the commercial fishery; over 90% of landings were made by the longline fleets (Harris and Hanke 2010).

The Halibut Survey is conducted annually, generally between May 22nd and June 22nd. Variations in the Halibut Survey fishing protocol include a shift to the use of larger hook size, larger geographic area that each 'station' encompasses, lack of consistency in stations sampled, and variation in soak time and bait type. These variations are not accounted for in the Cusk biomass index and could contribute to the high variability or bias the estimates.

Description of the Fishery

In the commercial fishery, Cusk are caught primarily in summer and fall, with very limited landings in winter. While the fishing year runs from April 1st through to March 30th of the following year, landings from April–November comprise between 93% and 98% of the fishing year landings from 2007–2014. Cusk landings have been declining, falling to 200t in 2014, and reaching only 175t by the end of November in 2015. Cusk landings are currently managed by bycatch caps and trip limits.

Table 1. Cusk Landings in metric tonnes from 2007 to 2015, the most recent complete fishing season is 2014.

Year	4X5YZ	4VW	Total
2007	963	55	1018
2008	561	48	609
2009	535	38	573
2010	439	29	468
2011	444	34	477
2012	442	39	481
2013	341	39	380
2014	171	29	200
2015	146	29	175

Analysis and Response

The 57 fixed stations from the Halibut Survey that have been sampled in all years since 1999 are used to calculate the survey indices for Cusk (Harris et al. 2012). In 2014, data from Station 159 was excluded due to serious damage to the gear, which resulted in a non-typical catch. The long-term mean for Station 159 is 13.2kg.

The subset of stations includes some of the preferred habitat for Cusk, such as the deeper areas along the shelf edge, although only a few of these 57 stations are in the Gulf of Maine, the area of highest commercial landings. The catches at each station (standardized to catch(kg)/1000 hooks) were used to calculate a biomass index. When the number of hooks fished was not recorded, it was assumed that the survey standard of 1000 hooks was fished in the single set. In some cases, stations were fished by 2 or 3 sets of fewer hooks that sum to roughly 1000 hooks. In these cases, all of these sets were included in calculating the standardized catch for the station.

The recent trend in the Halibut Survey (3-year running geometric mean) was used as the biomass index to determine the status of the Cusk biomass in relation to the reference points.

The biomass index from the Halibut Survey has been at or above the proposed LRP since 2008 (Figure 1). A high level of uncertainty is indicated by the wide confidence interval.

Indicator of Stock Status

The 3-year geometric mean (2013-2015) of the survey index for Cusk is 19.0 kg (Figure 1). The confidence interval of the individual indices in all years, except 2006, encompasses the LRP.

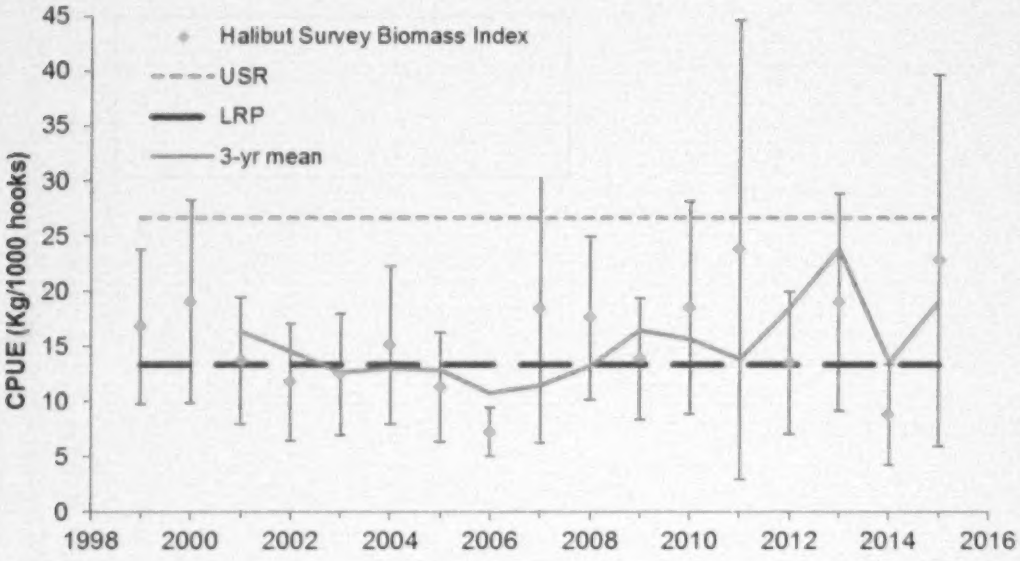

Figure 1. The green dashed reference line represents the upper stock reference point, USR, the red dotted reference line represents the limit reference point, LRP, the blue diamonds represent the biomass index for Cusk in the Halibut Survey, including the 95% confidence interval, and the heavy blue line represents the three-year geometric mean of the index.

Conclusions

The 3-year geometric mean (2013-2015) of the Halibut Survey biomass index for Cusk remains above the LRP at 19.0 kg.

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Sources of Information

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